REPORT

OF THE

INDIAN STANDARDS INSTITUTION

SPECIAL COMMITTEE ON WEIGHTS & MEASURES

1949

INDIAN STANDARDS INSTITUTION
19 UNIVERSITY ROAD
DELHI 2

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CONTENTS

Page

1. HISTORICAL BACKGROUND 1

2. ISI RECOMMENDATIONS 3

APPENDIX A—Composition of the ISI Special Committee on Weights and Measures 6

APPENDIX B—Brief Summary of Committee Proceedings . . . 8

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I. HISTORICAL BACKGROUND

1.1 Weights and measures in India have never been standardized for the country as a whole. As a consequence numerous systems exist resulting in a confusing state of diversity, significant variations occurring from village to village sometimes in the same district. With the increase in the commercial and industrial activities in the country, this diversity has created an element of uncertainty in trade and has rendered fraud, specially on the part of retailers, as easy as it is profitable. Attempts at standardization, however, date as far back as 1801. Since then the Central and the Provincial Governments have appointed several committees, at different times; notable among those are the committees appointed by the Government of India in 1867-68 and in 1913-14. But the results achieved did not go beyond the Regulation VII of 1833 which fixed the weight of the Furruckabad rupee at 180 grains English weight, the Government of India resolution of November 1854 which fixed the standard railway maund at 40 seers ($82\frac{2}{7}$ lb) and the Measure of Length Act of 1889 which fixed the imperial yard with its subdivisions in feet and inches as the primary unit of length.

1.2 Failure of all these attempts displays a tragic lack of unity of purpose as between the Secretary of State for India and the then Government of India. The Committee of 1867-68 recommended the adoption of the English Standards of weights and measures with, however, a strong note of dissent from three of its members who recommended the metric system. The Government of India accepting the minority note of dissent, passed the Indian Weights and Measures Act of 1870 which defined the kilogramme as the standard of weight. The Act was, however, refused sanction by the Secretary of State on the ground that it was too severe and extensive. The Government then modified the Act, still keeping the unit of weight, the seer, equal to the kilogram, and reintroduced it in August 1871 (Act XXXI of 1871). But even this amended Act has remained a dead letter in the statute book, since no notification has ever been issued under it.

1.3 In 1901, the Secretary of State for India forwarded to the Government of India a paper presented to the Parliament regarding the adoption of the metric system by European countries. By that time, however, the Government of India had come to the decision that the adoption of the metric system by the U.K. should precede its adoption by India.

1.4 The Committee of 1913-14 made an extensive survey of all attempts at standardization of weights and measures since 1801. In their deliberations, the Committee issued two questionnaires, ascertained the views of all Provincial Governments and examined witnesses from Chambers of Commerce, leading citizens, merchants and traders. They made definite recommendations for the adoption of a standard system which they based on a combination of the Indian and the English systems. One of the three members, Mr. A. Y. G. Campbell, however, submitted a strong note of dissent recommending that it was eminently desirable that the Government should take steps without further delay to constitute the metric system as the uniform system of weights and measures in India.

1.5 The report of the 1913-14 Committee met with the approval of the Central as well as the Provincial Governments. The Government of India, however, decided to adopt standards of weights only and not of length or area. They further felt that the enforcement should, for the time being, carried out under Provincial Legislations till such time as a strong opinion for central legislation was formed.

1.6 By 1939 public opinion for a central legislation was considered as having crystallized to the extent that the Central Legislature could pass the Standards of Weights Act (Act IX of 1939) applicable to the whole of British India. The Act repealed the Weights and Measures of Capacity Act XXXI of 1871 in so far as the establishment of standards of weights was concerned. The Governor General gave his assent on 28 March 1939 and by notification No. 33-C(6)/37A dated 13 June 1942 the Act was brought into force from 1 July 1942. The Act defined the standard grain in terms of an iridioplatinum cylinder in the custody of the Mint Master, Bombay, and laid down the following standards of weights in terms of the standard grain :

a) the standard tola, being a weight of 180 standard grains ;

b) the standard seer, being a weight of 80 standard tolas or 14,400 standard grains ;

c) the standard maund, being a weight of 40 standard seers ;

d) the standard pound, being a weight of 7,000 standard grains ;

e) the standard ounce, being one sixteenth part of the weight of a standard pound ;

f) the standard hundredweight, being a weight of 112 standard pounds ;

g) the standard ton, being a weight of 2,240 standard pounds.

1.6.1 In the Government of India Act of 1935, though ' standards of weights ' is a central subject, ' weights and measures ' is in the Provincial List. Accordingly the Government of India had to request the Provincial Governments to undertake legislations for enforcement, following the lead given in the Act IX of 1939. In the present constitution this ambiguity has been set right by including *' establishment of standards of weights and measures '* in the Union List of subjects and *' weights and measures except establishment of Standards '* in the States List.

1.6.2 The Government of C.P. in 1928 and the Government of Bombay in 1932 had already enacted legislations on weights and measures. As a result of the request from the Government of India, other provinces, except Bengal and Assam, also passed similar Acts. The position of the Provincial Legislations, as it stands now, is as follows :

ASSAM	... No Act on weights and measures.
BIHAR	... Weights Act, 1947 (Act XVII of 1947).
BOMBAY	... Weights and Measures Act, 1932 (Act XV of 1932).
C.P.	... Weights and Measures Act, 1928 (Act II of 1928).
MADRAS	... Weights and Measures Act, 1948 (Act XXII of 1948).
ORISSA	... Weights and Measures Act, 1943 (Act VII of 1943).
PUNJAB	... Weights and Measures Act, 1941 (Act XII of 1941).
U.P.	... Weights and Measures Act, 1947 (Act XXIII of 1947)
WEST BENGAL	... No Act on weights and measures.

1.6.3 The various Provincial Legislations generally conform to the Central Legislation with a few exceptions. The unit for the measure of length is usually the yard, defined as the length of the standard yard maintained by the Mint Master at Bombay. For longer measures, the furlong (220 yards) and the mile (1760 yards) are provided ; for measures of area and volume, square and cube of the standards of length ; acre (4,840 sq yd) being additionally allowed for area. Local units for dry and wet measures of capacity, which vary from province to province, are also allowed in the provincial Acts, but they are usually made integral multiples or submultiples of the basic units.

1.7 By the time the Government of India passed the Act of 1939, unofficial opinion in the country grew more inclined to the adoption of the metric system on an all-India basis. In 1940 the Manufacturing Subcommittee of the National Planning Committee, in their interim report, made the following recommendation :

> " Standardization of weights and measures on All-India basis should be carried out at an early date so that a uniform system of weights and measures is applicable to the whole country. For this purpose an institution similar to the British Standards Institute should be established at a central place. If other conditions permit, the metric system should be adopted for this purpose."

1.8 On 4 February 1946 a Bill was introduced by the Government of India in the Legislative Assembly to convert the currency to the decimal system of coinage, retaining the rupee as a standard unit and dividing it into 100 cents. This Bill was circulated for eliciting public opinion.

1.9 The Indian Science Congress Association at its Bangalore session in 1946 passed a resolution strongly advocating the decimalization of currency and weights and measures, simultaneously if possible. The matter was further considered at a meeting of the Executive Committee of the Indian Science Congress Association held on 8 March 1946 and presided over by Pandit Jawaharlal Nehru, and the following resolution was passed unanimously :

> " Resolved that the Science Congress notes with satisfaction that a Bill for the decimalization of Indian Currency has been introduced in the Legislative Assembly. The Science Congress is, however, of opinion that decimalization of currency alone is not enough, and considers the decimalization of weights and measures on the basis of the metric system to be equally urgent."

1.10 By a resolution of February 1947, the Government of India requested the Provincial Governments to take up the question of adopting the metric system of weights and measures.

1.11 In 1946 the Government of India by resolution No. 1-Std(4)/45, dated 3 September, had decided to establish the Indian Standards Institution, with the stated object, inter alia,

> " to consider and recommend to Government of India, national standards for the measurement of length, weight, volume and energy."

The Institution was inaugurated in February 1947 and actually started its activities in June of the same year. The Director immediately undertook to make a study of the position and compiled a report on the subject in September 1947 and suggested the adoption of the metric system with Indian nomenclature for basic units and an Indianized system of uniform nomenclature for fractions and multiples. This report was published subsequently in the ISI Bulletin of January 1949. Another report of the Director dealt with the decimalized coinage related, in respect of dimensions and weights, with the metric system.

1.12 The Engineering Division Council (EDC) of the Indian Standards Institution (ISI) at its first meeting held in November 1947 considered the reports of the Director and reviewed the prevalent state of standards of weights and measures in the country. The EDC felt that it was high time for the ISI to ascertain the general consensus of opinion in the country and recommend to the Government a definite plan for standardization in the field. The EDC resolved as under :

> " **1.** The Engineering Division Council of the Indian Standards Institution recommends that the Executive Committee of the General Council may appoint a special Sectional Committee to consider and report on Basic Standards for Weights and Measures for adoption in India, with a view to the Indian Standards Institution making recommendations to the Government of India in accordance with Para 3(a) of the Memorandum of Association of the Institution and Para 4(a) of Resolution No. 1-Std(4)/45 dated the 3rd September 1946, of the Department of Industries and Supplies, Government of India. This Sectional Committee should be representative of all Division Councils of the ISI.
>
> " **2.** The EDC further recommends that the terms of reference of the proposed Sectional Committee should include the fullest possible consultation of all interested parties including Provincial and State Governments so that their Report will represent the best possible consensus of opinion on this very fundamental matter.
>
> " **3.** The EDC further recommends, in order to avoid overlapping and confusion, that, until the Indian Standards Institution has submitted its recommendations to Government, the collection of interested and informed opinion should be left strictly to the Institution."

1.13 The Executive Committee, duly approving the resolution, forwarded it to the Government of India for concurrence. The Executive Committee further requested that, in view of the executive responsibility of the Industry and Supply Ministry in this respect, an officer of the Industry and Supply Ministry of not below the rank of Joint Secretary be appointed as the Chairman of the proposed ISI Committee. The concurrence of the Government in the proposal was obtained in May 1948 and a special Committee on weights and measures, with terms of reference as given in the EDC resolution, was appointed. The personnel of of the Committee is given in Appendix A.

1.14 The Committee met thrice in New Delhi, on 17 March 1949, on 25 July 1949 and on 14 November 1949. At its first meeting the Committee decided to invite representatives of all Provincial and State Governments to the future meetings and with a view to ascertaining the consensus of opinion in the country, it was decided to issue a questionnaire to all interests concerned.

1.15 The second meeting of the Committee was representative of all Provincial and State Governments and all commercial interests in the country. After prolonged deliberations on the various points of view expressed by different authorities, the Committee concluded that the general consensus of opinion in India was in favour of the adoption of the metric system, but agreed that, in order to spread out the rather considerable expenditure involved in the change-over, the change-over should be carried out in three stages covering a period of 11 to 15 years. A brief summary of the proceedings of the Committee is given in Appendix B.

1.16 Several resolutions were adopted at the first two meetings and a Subcommittee was appointed at the second meeting to formulate these proposals in exact terms. On the basis of these, the ISI Directorate was asked to draw up a report for adoption by the Committee at its third meeting.

1.17 All recommendations of the Committee, adopted at various stages, have been consolidated in the following section of this Report.

1.18 This Report was adopted at the third meeting of the Committee on 14 November 1949. The Executive Committee of the ISI considered the Report on 15 November 1949 and directed that it be circulated to the General Council of the ISI for adoption before being forwarded to the Government of India. The General Council adopted the Report on 22 December 1949.

2. ISI RECOMMENDATIONS

2.1 Standard System of Weights and Measures — The Committee has reviewed the great diversity of weights and measures now in use in India and feels that, to facilitate the development of the national and international trade and to put an end to the colossal loss in time and energy that this diversity causes, the weights and measures of the country should be standardized as early as possible. For this purpose, the Committee endorses the resolution of the Interim Government of India of February 1947 (*see* **1.10**) and recommends that the metric system be adopted as the standard system of weights and measures in India.

2.2 Introduction in Central Agencies — In view of the impending development programmes for the establishment of centrally controlled industrial and technical establishments, the Committee recommends that, as early as practicable, metric standards should be introduced in all the agencies under the control of the Government of India, such as the Railways, the Postal Services, the Defence Services and other scientific, technical and industrial establishments.

2.3 Introduction in Public Life — As regards the adoption of the metric system of weights and measures in the general public life of the country and in everyday trade activities, the Committee appreciates that the process will have to be necessarily slow. After carefully considering the difficulties inherent in the change-over, the Committee has prepared detailed programmes for systematic and gradual adoption of the metric standards as outlined below.

2.4 Use in Scientific Documents and Literature — The Committee endorses the decision of the ISI to accept the recommendation of the Empire Scientific Conference of 1946 that whenever units are expressed in scientific literature in systems other than the metric, metric equivalents should always be indicated. The Committee recommends that this practice be immediately adopted as a general rule in all technical publications issued in India.

2.5 Nomenclature — The Committee recommends that in the event of the adoption of the metric system of weights and measures, its international nomenclature be adopted in toto. The Committee further recommends that, in the event of the Central Legislature preferring the adoption of Indian or Indianized nomenclature for the corresponding metric units, it is important to avoid the retention of the existing names such as 'sair', 'guz', etc. as they are liable to lead to confusion in the minds of the public.

(*Note of dissent* — Bawa Bachittar Singh, who represented the Federation of Indian Chambers of Commerce and Industry in the first meeting and then resigned, wished it to be recorded that he was not in favour of the adoption of the international nomenclature and preferred the nomenclature suggested in Dr. Verman's report, both for basic units and for multiples and submultiples.)

2.6 Expenditure in the Change-over — The Committee is aware of the expenditure required for the change-over to the metric system, which is likely to be considerable. It is, therefore, recommended that the transition period be extended over a number of years and the actual change-over carried out in three stages as detailed below. The Committee is, however, satisfied that ultimately the standardization, along the lines recommended, would more than repay the expenditure inevitable in its introduction. Its uniformity will lead to security to the masses in their day-to-day commercial dealings; its simplicity would result in a tremendous saving of time, money and energy in commercial and technical calculations and in education and training of the younger generation; its international character would help stimulate overseas trade; etc.

2.7 Transition — The Committee recommends that the change-over to the metric system be carried out in three distinct stages as follows:

a) The *Preparatory Stage* of three to five years when no extensive changes would be enforced, but intensive education and dissemination of information on the metric system of weights and measures would be carried out and, wherever practicable, gradual introduction of the metric system would be encouraged.

b) The *Change-over Stage* of about five years in which the change-over will be effected in the agencies under the control of Central and Provincial administrations and in public life, and

c) The *Final Stage* of three to five years when the country would be brought over to the metric system entirely and after which no other system would be regarded as legal.

2.8 Central Liaison Agency — The Committee recommends the creation of a Central Agency for guiding educational activity, for carrying on intensive propaganda to popularize the new system, for co-ordinating the activities of Central, Provincial and States Governments in respect of all the measures connected with the change-over, and for acting as a clearing house of all information connected with the subject. This agency may or may not be needed after the third period, since all questions of enforcement will be the responsibility of the Provincial and States units.

2.9 Sale by Weight and Volume — The Committee considered the suggestion for specifically providing in Central and Provincial Legislations for the mode of sale of different commodities and feels that such a provision would, to a large extent, remove the malpractices at present prevalent in the trade.

2.10 Decimalized Currency — The Committee feels that it will be an advantage if the adoption of decimalized currency precedes the introduction of the metric system of weights and measures. The Committee, therefore, recommends that the decision of the Interim Government of India for the adoption of the decimalized currency should be implemented as early as possible. The Committee further recommends that weights and dimensions of the new coins should be related to the metric system of weights and measures, so as to facilitate propagation of general knowledge of the magnitude of the new units among the public.

2.11 Central Legislation — With the above objectives in view, the Committee recommends that as soon as possible the Centre should initiate legislation on the subject of weights and measures which, among other things, should provide for the following:

2.11.1 Standards of weights and measures (linear, square, cubic and capacity) based on the metric system.

2.11.2 Nomenclature based on the international basic units and fractions and multiples thereof.

2.11.2.1 Use of international nomenclature for basic units to be compulsory and universal.

2.11.2.2 Indian nomenclature for multiples and submultiples may be adopted but in all these cases any name applying to a fraction or a multiple should contain the name of the basic unit, for example, ' Centimeter ' may be termed ' Satakmeter ', etc.

2.11.3 Schedule specifying commodities of everyday use to be sold on the basis of specific units of either weight, volume, linear measure, square measure or number. A schedule or schedules may be found necessary allowing use of more than one set of units for certain commodities.

> (Some members of the Committee felt that this should form the subject matter of a separate Act.)

2.11.4 A model form of legislation for adoption by Provinces and States for the purpose of enforcement of standards. This model, among other things, should include tolerances of weights and measures to be allowed for different purposes. The Provinces and States should be required to adopt this model legislation as such but minor modifications may be permitted, if found absolutely necessary to suit local conditions.

2.11.5 Creation of a Central Agency for education, propaganda and co-ordination of activities of Central Departments and Provincial and State units in respect of all activities envisaged to be carried out during the three stages of development.

2.11.6 Defining the three stages of change-over and provision for periodic review of the time limits allocated for each.

2.12 Programme of Action — The Committee recommends the following programme of activities for the three stages of development :

2.12.1 *Preparatory Stage*

2.12.1.1 The Government of India to introduce the decimal system of currency in which the weights and dimensions of coins should be related to the metric system.

2.12.1.2 Intensive education and propaganda programme, including, among other things, the following :

a) teaching in elementary and secondary schools and in technical and engineering institutions ; schools to keep samples of all standard metric weights and measures ;
b) press and radio publicity ;
c) public speeches and press conferences by eminent people ;
d) publicity films (using mobile cinema wherever possible) ;
e) popular exhibitions ;
f) publication of informative bulletins and pamphlets including conversion tables ;
g) free distribution of conversion tables through post offices ;
h) public discussions and symposia ;
j) publicity through village panchayats ;
k) the Government to sell to the public standard metric weights and measures at the beginning, later, private parties to produce and sell these units.

2.12.1.3 All Central and Provincial units to initiate preliminary preparations and estimates of cost of equipment for conversion to the new system.

2.12.1.4 Wherever regulated markets exist, the authorities controlling them might introduce the use of metric system in their day-to-day operations.

2.12.1.5 All agencies to initiate designing their new schemes of development on the metric system with the ultimate object of going over to that system entirely at an appropriate stage.

2.12.1.6 All engineering designs and plans which may be considered necessary to be executed on the basis of Foot-Pound System to give metric equivalents.

2.12.1.7 Centre to establish an official agency for the preparation, deposition and checking of primary, secondary and reference standards.

2.12.1.8 Planning of enforcement agencies by Provincial and State units wherever they are needed and augmentation of existing agencies for the new task.

2.12.1.9 If any of the Provincial or State Governments feel ready for the adoption of the model form of legislation suggested by the Centre, they should be free to adopt it during this period.

2.12.2 *Change-over Stage*

2.12.2.1 Adoption by all Provincial and State Governments of the model legislation proposed by the Centre.

2.12.2.2 Implementation of the planning suggested in para **2.12.1.8.**

2.12.2.3 All Central Agencies to go over to the new system from a red letter day to be declared by each agency, retaining existing facilities only for replacement of parts of existing machinery.

2.12.2.4 All engineering designs and plans to be based on metric system giving Foot-Pound equivalents where considered necessary.

2.12.2.5 In everyday public use and for trade purposes, metric system to be gradually and progressively introduced.

2.12.2.6 Land records to be changed to the new system at the time of transactions, such as transfer, sale or any other registration of land.

2.12.3 *Final Stage* shall be in the nature of a period of grace during which the change-over to the metric system will be finalized and the use of all other systems eliminated from the legitimate activities of all departments, Central, Provincial or State, and from everyday public life. Old land records, however, may remain in the older system of measure until any transaction takes place, when they will have to be changed to the new system. After the end of this period the metric system shall be the only recognized system having legal sanction.

APPENDIX A

(*Item* 1.13)

COMPOSITION OF THE ISI SPECIAL COMMITTEE ON WEIGHTS & MEASURES (EC 4)

Organization	*Name of Member*
1. Directorate General of Industries and Supplies	Dr. J. C. Ghosh (*Chairman*), Director General, Industries and Supplies
2. Ministry of Industry and Supply	Mr. K. Ram, Deputy Secretary
3. Ministry of Defence, Army Headquarters	Mr. C. K. Haldar, Technical Development Establishment (Weapons)
4. Ministry of Defence, Air Headquarters	S/Ldr. O. P. Bharadwaj
5. Ministry of Defence, Naval Headquarters	Lt. Commander (E) H. D. Kapadia
6. Ministry of Education, Scientific Nomenclature Committee	Dr. S. S. Bhatnagar, Director, Scientific and Industrial Research, and Secretary, Department of Scientific Research (*Alternative*) Prof. Suniti Kumar Chatterjee, Calcutta University, Calcutta
7. Ministry of Agriculture	Dr. T. G. Shirname, Agricultural Marketing Adviser to the Government of India (*Alternative*) Dr. B. C. Sen, Deputy Agricultural Marketing Adviser
8. Ministry of Railways, Railway Board	Mr. K. F. Antia, Deputy Chief Controller of Standardization
9. Ministry of Finance, Central Board of Revenue	Mr. A. N. Puri, Secretary, Central Board of Revenue
10. Ministry of Home Affairs, Census Commissioner to the Government of India	Mr. M. W. M. Yeatts (*Alternative*) Mr. D. Natarajan
11. Ministry of Commerce	Mr. S. K. Banerjee, Deputy Secretary
12. Ministry of Works, Mines and Power, Bureau of Mines	Dr. M. S. Krishnan, Director, Bureau of Mines
13. Department of Scientific Research, Council of Scientific and Industrial Research	Dr. K. N. Mathur, Assistant Director, National Physical Laboratory, Delhi
14. Federation of Indian Chambers of Commerce and Industry	Dr. A. H. Pandya, Hindustan Construction Co., Bombay
15. Associated Chambers of Commerce of India	Mr. H. P. Waegeli, Volkart Brothers, New Delhi
16. All-India Manufacturers Organization	Mr. S. K. Daru, Tobacco Manufacturers (India) Ltd.

Organization	*Name of Member*
17. INSTITUTION OF ENGINEERS (INDIA)	Dr. H. L. Roy, College of Engineering and Technology, Jadavpur Mr. E. A. Nadirshah, Chief Engineer, The Concrete Association of India, Bombay
18. NATIONAL INSTITUTE OF SCIENCES OF INDIA	Prof. S. K. Mitra, Calcutta University, Calcutta (*Alternative*) Mr. G. C. Mitter, Technical Adviser, India Government Mint, Bombay

REPRESENTATIVES OF PROVINCIAL GOVERNMENTS

19. ASSAM	Shri L. K. Handique, Director of Agriculture
20. BIHAR	Shri B. N. Sinha, Senior Marketing Officer and Chief Inspector of Weights
21. BOMBAY	Shri D. N. Kowshik, Director of Industries
22. C.P. AND BERAR	Shri R. N. Gadre, Provincial Marketing Officer
23. EAST PUNJAB	Shri S. Kanwarjit Singh, Chief Inspector of Weights and Measures
24. MADRAS	Shri Y. Sivarama Menon, Assistant Secretary, Development Department
25. ORISSA	Shri S. C. Roy, Additional Secretary, Development Department
26. U.P.	Shri B. K. Ghoshal, Director of Cottage Industries
27. WEST BENGAL	Shri Mukul Gupta, Deputy Director of Industries

सत्यमेव जयते

REPRESENTATIVES OF STATES

28. COOCH BEHAR	Chief Minister
29. HIMACHAL PRADESH	The Chief Commissioner
30. HYDERABAD	Mr. F. D. Pestonji, Deputy Secretary, Industry and Commerce, Hyderabad
31. MYSORE	Shri K. Nanjappa, Assistant Marketing Officer
32. PATIALA AND EAST PUNJAB STATES	Shri K. L. Budhiraja, Director of Industries
33. SAURASHTRA	Shri P. V. Contractor, Warden of Weights and Measures
34. TRAVANCORE	Travancore State Industrial Liaison Officer
35. VINDHYA PRADESH	Shri N. K. Dube, Commissioner of Customs and Excise
36. MADHYA BHARAT	Shri R. Swami, Director of Industries

APPENDIX B

(Item 1.15)

BRIEF SUMMARY OF COMMITTEE PROCEEDINGS

1. The Committee held two meetings, on 17 March 1949 and on 25 July 1949, and a third meeting to adopt the Report on 14 November 1949, all in New Delhi under the Chairmanship of Dr. J. C. Ghosh, Director General of Industries and Supplies.

2. In his introductory speech, the Chairman impressed upon the members of the Committee the urgency of the question which the Committee was called upon to decide. He pointed out that the question had assumed special significance in view of the impending programme of large-scale industrial development in India, which necessitates an immediate decision as regards the system of weights and measures on which the design of the new plants could be based. For example, the designers of the new machine tool factory project would like to know whether it should be based on the metric system, the inch-pound system, or an indigenous system.

3. The Director, ISI, drew the attention of the Committee to the Government of India Resolution of February 1947 requesting the Provinces to consider the feasibility of adopting the metric system of weights and measures. He pointed out that the question before the Committee had three distinct aspects, namely :

1) standard system of weights and measures,
2) nomenclature of basic units as well as of their multiples and submultiples, and
3) methods necessary for the introduction of the system recommended.

4. Discussions in the meetings centred round these three points. At its first meeting, the Committee found itself unanimous in recommending the adoption of the metric system as the all-India standard, though there was some difference of opinion on the question of nomenclature. On the point of enforcement of the new system, the Committee decided to issue a questionnaire and elicit further opinion of Provinces, States, industrial organizations and the Central Government Departments concerned. It was also agreed that active participation of Provincial and State Governments in the work of the Committee was necessary and that one representative from each of the Provincial and State Governments should be invited to attend further meetings of the Committee.

4.1 The questionnaire issued by the Committee is given below :

QUESTIONNAIRE ON WEIGHTS AND MEASURES

Preamble

In concurrence with the Ministry of Industry and Supply, Government of India, the Indian Standards Institution has set up a Special Committee on Weights and Measures which is widely representative of all important interests concerned with this subject, including important Central Government agencies, industry, commerce, science, engineering, etc. The membership of the Committee is attached.

In the Draft Constitution of India, the Union List of Subjects includes :

> ' 61. The Establishment of Standards of Weights and Measures ' ;

and the State List of Subjects includes :

> ' 39. Weights and Measures except the Establishment of Standards '.

The Committee noted that the Government of India has already decided to adopt a decimal system for currency and coinage in India.

This ISI Committee at its first meeting held on 17 March 1949 arrived at a general consensus of opinion that the metric system of weights and measures together with its international nomenclature for multiples and submultiples of basic units should be adopted as an all-India standard. The Committee also decided that if the Central Legislature preferred Indian or Indianized nomenclature for the metric sets of weights and measures, new names should be coined and the use of existing names such as ' tola', ' chatak', ' sair', ' mun', ' guz', ' girah', ' bigah', etc, should be avoided, as they will lead to confusion.

The Committee appreciated the inherent difficulties in the change-over, and considered that in the first instance the new system should be introduced as early as practicable in all technical, educational, scientific and industrial and transport organizations working under the auspices of the Central Government.

With regard to the introduction of the metric system of standards in the general public life of the country, as in everyday trade, it was realized that the process had to be slow, and active participation of the Provinces and States in this programme was essential. Details regarding methods for its general adoption will have to be carefully planned and recommendations will have to be formulated by the ISI Committee for action by the Central, Provincial and State Governments.

The ISI Committee desires to elicit further authoritative opinion on the matters concerned with various aspects connected with the general introduction of the metric system and requests that considered replies may be given to the following questions by parties to whom this Questionnaire is addressed.

QUESTIONNAIRE

1. Do you favour the introduction, as early as practicable, of the metric standards in all central agencies such as the railways, postal services, defence services, centrally controlled industrial establishments, etc ?

NOTE — India is on the threshold of large-scale developments of many major industries which may be centrally controlled. In view of such developments, it is important that an early decision be arrived at in respect of standards on the basis of which new plant be procured. It is realized that the present equipment, not capable of immediate conversion, will remain in service until it becomes obsolete.

2. Do you favour the establishment of the metric standards in relation to every day public use for purposes of trade ?

NOTE — Establishment of metric standards does not imply their immediate introduction for general trade but rather means that the metric standards be legally recognized and be made available for immediate use and for enforcement by Provincial and State Governments as and when considered desirable.

3. Do you consider a three-year period sufficient between the date of establishment of metric standards by the Centre and their general introduction by the Provinces and States for the purpose of everyday trade ; or do you propose any other period ?

NOTE — It is not the intention that the change-over should be complete at the end of this period. For instance, existing land records need not be completely changed over to the new system ; change may be effected only at the time of re-registration in case of change of possession, etc.

4. What in your opinion should be the most effective method or methods of conducting intensive programme of education and propaganda by Central, Provincial and States agencies for facilitating the change-over to the metric system ?

NOTE — Certain Provinces and States have already in existence official agencies entrusted with the task of administering legislation on standards of weights and measures. It is suggested that wherever such agencies do not exist, they may be created, and all such agencies may be entrusted with the additional task of carrying on an intensive programme of education and propaganda which may include :

(a) teaching in elementary and secondary schools ;
(b) press and radio publicity ;
(c) public speeches and press conferences by eminent leaders and ministers ;
(d) publicity films ;
(e) popular exhibitions ;
(f) publication of informative bulletins and pamphlets including conversion tables ;
(g) public discussions and symposia ;
(h) enforcement of compulsory use in all court documents and government offices and official documents.

5. Do you agree that after the interim period the Provincial and State Governments should take all necessary steps for the enforcement of metric standards backed by their own legislation and should this legislation be of a uniform pattern based on a model form to be suggested by the Central Government ?

5. The ISI circulated this questionnaire to all Ministries of the Government of India, all Provincial and State Governments and important Chambers of Commerce, with the request that the questionnaire might be circulated to all departments or constituent organizations under them. Replies from most of these organizations were received before the second meeting of the Committee.

6. The views of members of the Committee, of various Governments, of Chambers of Commerce and other organizations, as expressed by their representatives present at the meetings or as received in writing, are summarized below :

6.1 *Ministry of Industry and Supply* — Mr. P. S. Sundaram, representative of the Ministry, drew the attention of the Committee to the decision of the Interim Cabinet taken in February 1947 that the Bill to introduce decimal currency in India amending the Indian Coinage Act of 1906, should be proceeded with and pointed out that the Bill was under circulation for public opinion. He stated that the Government thought that the introduction of the metric system of weights and measures would have to follow logically upon the introduction of the decimal system of coinage.

6.2 *Ministry of Defence* — The Ministry of Defence, in a written reply to the questionnaire, expressed the view that, though the Ministry agreed to the introduction of the metric system in principle, they did not consider it feasible to introduce the system in the defence services in the near future. Representatives of the Ministry from the Air, Army and Naval Headquarters explained the view as follows :

6.2.1 S/Ldr. O. P. Bharadwaj, representing the Air Headquarters, explained that, in view of the huge work and expenditure involved in converting the existing plant and equipment and also in view of the still existing need to import materials from the FPS countries, his Ministry thought it would be difficult to change over to any new system until such time as either the Indian industry was able to meet the defence requirements or until it became possible to obtain them from the metric countries. He thought, however, that it would be easier, when the time came, to effect the change-over in the Air Force owing to the high standard of education of the personnel.

6.2.2 *Army Headquarters* — Mr. C. K. Haldar, representative of the Army, expressed in the first meeting, i.e. before the written reply of the Defence Ministry was received, his personal opinion that the introduction of the metric system in the Army should not be difficult. He also stressed the necessity for retaining the international nomenclature.

In the second meeting, Mr. Haldar stated that the question of change-over to the metric system had been considered in all its details by the Directorate of Technical Development, Ordnance Factories and the Defence Science Advisory Committee. While the need for the change-over had been agreed to in principle, considerable difficulties were anticipated in effecting the conversion of the existing equipment and designs which would necessarily have to be spread over a fairly long period. Further, the cost of such conversion would be rather high. He suggested the following four stages for the introduction of the metric system of weights and measures in the Army :

a) 1st Stage — to convert existing drawings with double dimensions in both the systems,
b) 2nd Stage — to redesign all existing drawings in metric units,
c) 3rd Stage — to change over to designs in metric units for new manufacture, retaining the old ones for maintenance, and
d) 4th Stage — to eliminate all designs in FPS system.

He felt that all these stages would take about 15 to 20 years for the Army.

6.2.3 *Naval Headquarters* — Lt. Com.(E) H.D. Kapadia, representative of the Navy, said that any decision taken by the Navy would naturally be in keeping with those of the Army and the Air Force. He agreed with the views expressed by his colleagues and said that the Indian Navy would be prepared to adopt the metric system as far as possible. He further stated that in fact the metric system was being used at present in certain equipment such as the gunnery equipment.

6.3 *Ministry of Education* — The Ministry of Education, in a written reply to the questionnaire, agreed with all the points raised in the questionnaire except that they thought the three-year transition period would be rather inadequate for the change-over. They suggested five years.

6.3.1 Prof. Suniti Kumar Chatterjee, representative of the Scientific Nomenclature Committee, Ministry of Education, expressed the views of his Committee on the nomenclature. His Committee favoured greater use of Indian languages and thought that it would be advantageous to have Indianized names for the metric terminology. On the question of currency, he thought that it might be worth while for the Committee to examine the experience of the Nepal Government which had some time ago introduced decimal currency.

6.4 *Ministry of Agriculture* — Dr. T. G. Shirname, Agricultural Marketing Adviser, who represented the Ministry, agreed that it was desirable to adopt a rational system of weights and measures throughout the country and felt that the metric system was ideal for the purpose. He stressed the necessity of having uniform practice for enforcement in all Provinces and felt that there should be a strong directive from the Centre in this respect.

6.4.1 In a written reply the Ministry later on observed that the introduction of the metric system, if not synchronized with the decimalization of currency, would create confusion. On the point of transition, the Ministry thought that owing to the general illiteracy in the country a period of five to ten years would be necessary for the change-over. The Ministry further observed that in enforcing the new system, it was important to ensure that the public were never harassed over mere technical lapses.

6.5 *Ministry of Railways, Railway Board* — In a written reply to the questionnaire, the Railway Board expressed the view that the present was not the opportune time for the change-over to the metric system. The change, they thought, should follow as a natural sequence to the introduction of the decimal coinage.

6.5.1 Mr. K. F. Antia, representative of the Railway Board, stated in the first meeting that he had not had the time to ascertain the general views of the Board but expressed himself in favour of the view advocating introduction of the metric system. In the second meeting, Mr. Antia explained that the views of the Railway Board had been formulated after a careful consideration of the possible expenditure involved in the change-over. He felt it would be unwise to recommend initiation of such a change without at least a rough estimate of the expenditure involved, which might be prohibitive. At a later stage in the discussion, Mr. Antia suggested a possible solution in that the transition period might be so spread out as to reduce the annual expenditure involved to manageable limits. The change-over might thus be carried out in three stages as below :

a) first period of three to five years when no actual changes would be made, but intensive education and dissemination of information on the metric system of weights and measures would be carried out ;

b) second period in which the change-over will be effected in the agencies under the control of Central and Provincial administrations and in public life ; and

c) third period when the country would be brought over to the metric system entirely and after which no other system would be regarded as legal.

The Committee at the end of the discussions adopted the suggestion put forward by Mr. Antia.

6.6 *Central Board of Revenue, Ministry of Finance* — Mr. A. N. Puri, representative of the Board, told the Committee that they were not opposed to the introduction of the metric system, neither were they enthusiastic about it. If the Government finally decided to introduce it, his Board would require about two years for the change-over.

6.7 *Census Commissioner to the Government of India, Ministry of Home Affairs* — Mr. M. W. M. Yeatts, the Census Commissioner, agreed that it would be advisable to introduce the new system in the first instance in the technical and industrial establishments under the control of the Central Government. The rural areas should be left free to come gradually in line. In cases, however, it was necessary for rural population to invoke the authority of the Government in connection with any of their transactions, the use of the new system of units should be made mandatory, as for example in case of registration of sale of a piece of land. On the question of the machinery and method of enforcement he was of the opinion that this should be the responsibility of the Central Government.

6.7.1 In a written reply to the ISI questionnaire, Mr. Yeatts later on suggested the inclusion of ration shops, customs, tariffs, opium and hemp drug shops, etc, among the Central Agencies in which the new system could be first introduced.

6.8 *Government of Assam* — The Assam Government in a written reply approved of the proposal for adopting the metric system, observing that the public would take a long time to get familiar with the new system. They agreed on the other points raised in the questionnaire but thought that the transition period should be five years.

6.9 *Government of Bihar* — The Government of Bihar in their reply to the questionnaire expressed themselves against the adoption of the metric system. They thought that the time for such a reform had not yet come. If, however, the Government of India finally decided to proceed with the proposal, the Bihar Government suggested that introduction be simultaneous at the Centre and the Provinces.

6.10 *Government of Bombay* — The Government of Bombay, while supporting standardization of weights and measures, disapproved of the proposal for adopting the metric system. They observed that the change would be so radical and vast and would bring in its wake such a confusing state of affairs for the public who were mostly illiterate, that it could only be thought of on a strong demand for it from the public. Besides, the change would be a heavy strain on the administration.

6.10.1 Mr. D. N. Kowshik, representative of the Bombay Government, who attended the second meeting, agreed that if the transition was carried out in three distinct stages spread over a period of 10 to 15 years as suggested by Mr. Antia (Section **6.5.1**), his Government might approve of the proposal in spite of their earlier opposition.

6.11 *Government of C.P. and Berar* — The Government of C.P. and Berar in a written reply expressed the view that decimalization of weights and measures in use in India was a welcome step but not the introduction of the metric system which, being of foreign origin, was bound to create confusion for years to come.

6.12 *East Punjab* — The Government of East Punjab, while appreciating that the adoption of the metric system might be desirable as an ideal, felt that the change should await solution of other more urgent and pressing problems in the country. Even if it was thought desirable to proceed with the change, a period of transition of 10 years would be necessary. The Government further observed that the introduction of metric system of weights and measures and that of decimalization of currency should proceed together.

6.13 *Government of Madras* — The Madras Government, while extending their support for decimalization of weights and measures, observed that it would be worth-while to watch the result of decimalizing the currency before extending it to weights and measures. On the question of the transition period which was stipulated at three years, the Government thought that even five years might not be sufficient. On the point of enforcement, the Government held the view that enforcing legislation in the Provinces need not be of uniform pattern, so as to enable varying local conditions to be taken into account.

6.14 *Government of Orissa* — Mr. S. C. Roy, representative of the Government, stated that the metric system of weights and measures may be introduced in the Central Government agencies like Railways and Post Offices in the first instance. This will make the people accustomed to the metric system of weights and measures and then there will be not much difficulty in introducing it so far as his Province was concerned.

6.15 *Government of U.P.*— The U.P. Government approved of the proposals holding the view that Indian nomenclature should be retained and that the transition period should be five years.

6.16 *Government of West Bengal* — The West Bengal Government approved of the proposal for introducing the metric system in the Central Government agencies at the first instance, but advised caution in its introduction in everyday trade. In the Government's opinion, it would be wiser to observe the result of the change in the Central Agencies before any decision as to its adoption in everyday trade was taken.

6.17 *Government of Cochin* — The Cochin State Government while approving of the proposals observed that the change was so complicated that no time limit should be prescribed for the change-over.

6.18 *Government of Himachal Pradesh*, while not specifying any period for the transition, agreed with the points raised in the questionnaire.

6.19 *Government of Kutch* agreed with the points raised in the questionnaire in its entirety.

6.20 *Government of Mysore* thought that the transition period should be five to seven years but otherwise agreed with the points raised in the questionnaire.

6.21 *Government of Patiala and East Punjab States Union* approved of the proposals with the suggestion that the transition period should be five years.

6.22 *Government of Saurashtra*, while approving of the proposals in principle, observed that there could be no objection to legal recognition of the metric system but its enforcement should be postponed for a decade.

6.23 *Government of United States of Travancore and Cochin* agreed with the proposal in its entirety.

6.24 *Government of Vindhya Pradesh* extended their approval of the proposals but thought that the change-over would be very difficult.

6.25 *Institution of Engineers (India)* — Dr. H. L. Roy, representing the Institution, in a written reply approved of the introduction of the metric system but thought that the nomenclature should be decided after the question of national language for India had been settled. Mr. E. A. Nadirshah, their representative who attended the second meeting, stated that though it had not been possible for him to obtain the views of the different centres of the Institution, the general view, as far as he could gather from the individual members of the different centres concerned, was in favour of the metric system and he felt that the transition period of about 5 years would be sufficient for the purpose.

6.26 *National Institute of Sciences* — The National Institute, in a written reply to the questionnaire, agreed with all the points raised in it except that, they thought, the period of transition should be five years instead of three as stipulated. They also stressed the necessity of introducing the decimal currency simultaneously. Prof. S. K. Mitra who represented the Institute in the first meeting suggested that teaching of the metric system should be included in the curricula of primary schools.

6.26.1 Mr. G. C. Mitter, who represented the National Institute in the second meeting, stated that though the question of decimal currency was under consideration of the Government, owing to the heavy expenditure of the change-over, the Government might not like to adopt it. He, however, thought that, from the technical point of view, the present time was very opportune for change-over to the metric system as well as for the introduction of decimal currency.

6.27 Mr. S. L. Kirloskar, Chairman of the Engineering Division Council of the ISI, in a letter to the Committee expressed the view that the introduction of the metric system would effect the gear design, the thread system, the key-ways, etc, in the existing machines, so much so that the whole of the engineering industry would be thrown into a chaotic state.

6.28 *Federation of Indian Chambers of Commerce and Industry* — Bawa Bachittar Singh, representative of the Federation, told the Committee in its first meeting that his Federation had already conveyed to the Government their approval of the proposal for decimalization of weights and measures and its enforcement throughout India. On the question of nomenclature he felt that terms already in use, such as ' sair ', ' guz ', etc, should be retained, their magnitudes, however, being made equivalent to the metric units.

6.28.1 The Federation in a written reply later on expressed the view that, while they appreciated the advantages that could accrue from the adoption of the metric system, they were aware of the practical difficulties involved in implementing the proposal at one stage and felt that the present time was not suited for the change. They came to the conclusion that Government for the time being should proceed with the standardization of weights and measures, and that decimalization might be left over to be taken up at a future date.

The following constituent chambers of the Federation expressed their views as recorded below.

6.28.2 *Bengal National Chamber of Commerce* — The Bengal National Chamber welcomed the move for the adoption of the metric system and pointed out that full benefit from the introduction of decimal currency would be achieved only when the weights and measures were also decimalized.

6.28.3 *Federation of Baroda State Mills and Industries* — The Federation in their reply to the questionnaire agreed with all the points raised in it but thought that the transition period should be five years.

6.28.4 *Indian Non-Ferrous Metals Manufacturers' Association* — The Association in reply to the questionnaire conveyed their full approval of the proposals for adopting the metric system. They stressed the necessity of simultaneous introduction in the Centre, Provinces and States.

6.28.5 *Mahratta Chamber of Commerce and Industries* — The Mahratta Chamber, while conveying their agreement with the points raised in the questionnaire, stressed the need for enforcing legislation in this respect simultaneously in all provinces and states. On the question of nomenclature they supported the view for retention of existing names.

6.28.6 *Northern India Mercantile Chamber of Commerce* — This Chamber, approving the proposals, suggested that the change-over to the metric system should be spread over a period of not less than five years.

6.28.7 *Oil Merchants' Chamber, Bombay* — The Oil Merchants' Chamber, in replying to the questionnaire, observed that while they approved of standardization and also of decimalization of weights and measures, they were not inclined to the metric system. Instead, they preferred to decimalize the system now in use. The Chamber also felt that even after decimalization, the existing system might have to be allowed to exist in certain specialized industry, such as the engineering industry.

6.28.8 *United Chamber of Trade Association* — The United Chamber favoured the decimalization of the system of weights and measures in use in India rather than the adoption of the metric system. The Chamber further observed that introduction should be gradual and by stages, the standard of capacity being reformed first with the standard of weight to follow.

6.29 *Associated Chambers of Commerce of India* — Mr. Waegeli, representative of the Associated Chambers, told the Committee at its second meeting that he had nothing to add to the various views already communicated to the ISI by the member chambers of his Association. Views of the constituent chambers of the Association who replied to the questionnaire are recorded below:

6.29.1 *Bengal Chamber of Commerce* — The Bengal Chamber in a written reply expressed the view that it was eminently desirable to adopt the metric system on an all-India basis. They agreed with all the points raised in the ISI questionnaire with a note of caution that rapid conversion might prove to be very costly.

6.29.2 *Chamber of Commerce, Bombay* — The Bombay Chamber replied to the questionnaire agreeing on all points except the period stipulated for the transition, which they thought should be 5 to 10 years. They suggested that village panchayats might be briefed to spread knowledge of the system. They also recommended the use of mobile cinema for the purpose.

6.29.3 *Cochin Chamber of Commerce* — The Cochin Chamber, in reply to the questionnaire, agreed with all the points raised in it, but thought that the transition period should be 5 years. The Chamber made the additional suggestion that conversion tables should be distributed free, through the agency of post offices.

6.29.4 *Madras Chamber of Commerce* — The Madras Chamber welcoming the proposal suggested that the metric system might, in the first instance, also be introduced in commercial firms along with central agencies of the Government. The Chamber agreed with other points in the questionnaire but thought that the transition period should be from 3 to 5 years. On the question of nomenclature, the Chamber preferred to retain the existing names with new values.

6.29.5 *Punjab Chamber of Commerce* — The Punjab Chamber expressed their approval of the metric system in principle but thought that the cost and time of conversion would preclude its practical application for many years to come. The Chamber added that standardization of the existing systems was a pre-requisite for the adoption of the metric system and, as such, they desired that our concepts, for the time being, be confined to the proper enforcement of the existing standards. The Chamber also thought that the metric system might follow logically the introduction of decimal currency.

6.29.6 *Tuticorin Chamber of Commerce* — The Tuticorin Chamber, in their reply to the questionnaire, agreed with all the points raised in it. On the question of nomenclature, the Chamber supported the retention of the existing names. They further suggested that the practice of selling one commodity in more than one measure should be stopped.

6.29.7 *Upper India Chamber of Commerce* — The Chamber, while conveying their agreement to the points raised in the questionnaire, stated that great caution should be taken in a reform of this nature which would have widest repercussions on the everyday life of the people. The Chamber thought that the change should first be effected in the currency, before being extended to weights and measures.

6.30 *All-India Manufacturers' Organization* — The All-India Manufacturers' Organization, in a written reply to the questionnaire, agreed with all the points raised in the questionnaire with the additional suggestion that the decimal currency should precede the adoption of the metric system.

सत्यमेव जयते

Indian Standards

		Rs	as
IS : 2-1949	RULES FOR ROUNDING OFF NUMERICAL VALUES	0	8
IS : 3-1949	INCH-MILLIMETER CONVERSION FOR INDUSTRIAL USE	0	8
IS : 4-1949	PRACTICE FOR MAKE-UP OF PERIODICALS	0	8
IS : 5-1949	COLOURS FOR READY-MIXED PAINTS	4	0
IS : 6-1949	MODERATE HEAT DUTY FIRECLAY REFRACTORIES, GROUP 'A'	2	0
IS : 7-1949	MODERATE HEAT DUTY FIRECLAY REFRACTORIES, GROUP 'B'	1	0
IS : 8-1949	HIGH HEAT DUTY FIRECLAY REFRACTORIES	2	0
IS : 9-1949	METHOD OF TEST FOR DETERMINING SHRINKAGE IN WOVEN COTTON AND LINEN CLOTH ON WASHING	0	8
IS : 10-1949	PLYWOOD TEA-CHESTS	1	12
IS : 11-1949	GRADING OF WOOL FOR EXPORT	0	8
IS : 12-1949	STYLE MANUAL FOR DRAFTING INDIAN STANDARDS	1	8
IS : 13-1949	METHODS FOR GRADING PROCESSED MICA	2	0
IS : 14-1949	CLASSIFICATION OF PROCESSED MUSCOVITE MICA	1	4
IS : 15-1949	SEEDLAC	1	12
IS : 16-1949	SHELLAC	2	12
IS : 17-1949	DRY BLEACHED LAC	2	0
IS : 18-1949	ABBREVIATIONS FOR TITLES OF PERIODICALS	1	4
IS : 19-1949	PROCEDURES FOR TESTING COTTON TEXTILES AND CORDAGES (OTHER THAN JUTE) FOR RESISTANCE TO ATTACK BY MICRO-ORGANISMS	1	0
IS : 20-1950	CAST ALUMINIUM FOR UTENSILS	0	12
IS : 21-1950	WROUGHT ALUMINIUM FOR UTENSILS	0	12
IS : 22-1950	98 PERCENT ALUMINIUM NOTCHED BARS AND INGOTS FOR REMELTING PURPOSES	0	12
IS : 23-1950	99 PERCENT ALUMINIUM NOTCHED BARS AND INGOTS FOR REMELTING FOR AIRCRAFT PURPOSES	0	12
IS : 24-1950	BRAZING SOLDER	0	12
IS : 25-1950	ANTIFRICTION BEARING ALLOYS	0	12
IS : 26-1950	TIN INGOT	0	12
IS : 27-1950	PIG LEAD	0	12
IS : 28-1950	PHOSPHOR BRONZE INGOTS AND CASTINGS	0	12
IS : 29-1950	ALUMINIUM SHEETS AND COILS FOR AIRCRAFT PURPOSES	1	0
IS : 30-1950	ALUMINIUM-COATED HIGH-TENSILE ALUMINIUM ALLOY SHEETS AND COILS FOR AIRCRAFT PURPOSES	1	4
IS : 31-1950	ALUMINIUM-MANGANESE ALLOY SHEETS AND COILS	1	0
IS : 32-1950	CODE FOR SEAWORTHY PACKAGING OF WOOLLEN TEXTILES	1	0
IS : 33-1950	METHODS OF TEST FOR DRY PIGMENTS AND EXTENDERS FOR PAINTS	1	4
IS : 34-1950	BASIC CARBONATE OF LEAD (WHITE LEAD) FOR PAINTS	1	0
IS : 35-1950	ZINC OXIDE FOR PAINTS	1	0
IS : 36-1950	LEADED ZINC OXIDE FOR PAINTS	1	0
IS : 37-1950	LITHOPONE FOR PAINTS	1	4
IS : 38-1950	ANTIMONY OXIDE FOR PAINTS	1	0
IS : 39-1950	BASIC SULPHATE OF LEAD FOR PAINTS	1	0
IS : 40-1950	CARBON BLACK FOR PAINTS	0	12
IS : 41-1950	BONE BLACK FOR PAINTS	1	0
IS : 42-1950	VEGETABLE BLACK FOR PAINTS	0	12
IS : 43-1950	LAMP BLACK FOR PAINTS	0	12
IS : 44-1950	BLACK OXIDE OF IRON FOR PAINTS	1	0
IS : 45-1950	MANUFACTURED RED OXIDES OF IRON FOR PAINTS	1	0
IS : 46-1950	NATURAL RED OXIDES OF IRON FOR PAINTS	1	0
IS : 47-1950	OCHRE FOR PAINTS	1	0
IS : 48-1950	NATURAL SIENNA (RAW AND BURNT) FOR PAINTS	0	12
IS : 49-1950	NATURAL UMBER (RAW AND BURNT) FOR PAINTS	0	12
IS : 50-1950	LEAD CHROME AND LEAD MOLYBDATE FOR PAINTS	1	0
IS : 51-1950	ZINC CHROME FOR PAINTS	1	0
IS : 52-1950	CADMIUM LITHOPONE FOR PAINTS	1	0
IS : 53-1950	BRUNSWICK GREEN FOR PAINTS	1	0
IS : 54-1950	GREEN OXIDE OF CHROMIUM FOR PAINTS	1	0
IS : 55-1950	ULTRAMARINE BLUE FOR PAINTS	0	12
IS : 56-1950	PRUSSIAN BLUE FOR PAINTS	1	0
IS : 57-1950	RED LEAD FOR PAINTS AND JOINTING PURPOSES	1	0
IS : 58-1950	LITHARGE FOR PAINTS	1	0
IS : 59-1950	PIGMENT DYESTUFF FOR PAINTS	1	0
IS : 60-1950	LAKE PIGMENTS FOR PAINTS	1	0
IS : 61-1950	SLATE POWDER FOR PAINTS	0	12
IS : 62-1950	GRAPHITE FOR PAINTS	0	12
IS : 63-1950	WHITING FOR PAINTS	1	0
IS : 64-1950	BARYTES FOR PAINTS	1	0
IS : 65-1950	BLANC FIXE FOR PAINTS	1	0
IS : 66-1950	ASBESTINE FOR PAINTS	0	12
IS : 67-1950	SILICA FOR PAINTS	1	0
IS : 68-1950	KAOLIN FOR PAINTS	1	0
IS : 69-1950	GYPSUM (CALCIUM SULPHATE) FOR PAINTS	1	0
IS : 70-1950	CUPROUS OXIDE FOR PAINTS	1	0
IS : 71-1950	MERCURIC OXIDE FOR PAINTS	1	0
IS : 72-1950	ALUMINIUM POWDER FOR PAINTS	1	0
IS : 190-1950	CONIFEROUS SAWN TIMBER INTENDED FOR FURTHER CONVERSION	1	4
IS : 191-1950	COPPER	0	12
IS : 192-1950	SILVER SOLDER	0	12
IS : 193-1950	SOFT SOLDER	0	12
IS : 194-1950	RECOMMENDATIONS FOR REFRACTORIES FOR RAILWAYS	1	0
IS : 195-1950	FIRECLAY MORTAR FOR LAYING FIRECLAY BRICKS	0	12
IS : 196-1950	ATMOSPHERIC CONDITIONS FOR TESTING	1	0
IS : 199-1950	METHODS FOR THE ESTIMATION OF MOISTURE, TOTAL SIZE, STARCH, ASH AND WAX CONTENT IN GREY AND BLEACHED COTTON TEXTILE MATERIALS	1	0
IS : 200-1950	METHOD FOR DETERMINATION OF COPPER NUMBER OF COTTON TEXTILE MATERIALS	1	0
IS : 201-1950	METHODS OF ANALYSIS OF AND TOLERANCES FOR WATER FOR TEXTILE PURPOSES	1	0

		Rs	as
ASA Z1·3-42	CONTROL CHART METHOD OF CONTROLLING QUALITY DURING PRODUCTION	5	0

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